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*Iisdem igitur datis, jungatur* \*  $AI$ , & *producatur in*  $S$ , *donec*  $AS$  *fiat*  $equalis$   $AH$ , *junctaque*  $HS$ , & *bisecta*  $IS$  *in*  $M$ , *ducatur* \* *V. Fig. IX.* *per*  $M$  *recta*  $RMQ$  *normalis ad*  $HS$ , *in quam cadat ex*  $A$  *normalis*  $AQ$ , & *cui parallelus ducatur radius*  $AC$ . *Tum* *factis tribus proportionalibus*  $IA$ ,  $AC$ ,  $AE$ , *fiat ut*  $SA$  *ad*  $AE$ , *ita*  $MQ$  *ad*  $AD$ , &  $RS$  *ad*  $AP$  (*in recta*  $AQ$  *versus*  $Q$ ;) & *in eadem ab alia parte* *sumatur*  $DO$  *equalis*  $DC$ . *Demum, bisecta*  $PD$  *in*  $X$ , *inclinetur per*  $X$ , *angulo semi-recto ad*  $AX$ , *recta*  $VXL$ , *occurrentis normali in*  $D$  *recte in puncto*  $V$ , & *in quam ex*  $O$  *cadat normalis*  $OB$ . *Ajo, si fiat ut*  $VX$  *ad*  $XB$ , *ita*  $XB$  *ad*  $BL$ , *punctum*  $L$  *esse verticem, LV axem, XV latus rectum Parabole, quæ Problemati satisfacit omni casu; secans nimirum Circulum datum in punctis*  $K$ , *quorum supremum & infimum ad Problema Alhazenianum pertinent, reliqua ad aliud, de quo nuper ad te scripsi.*

*Datur, ut supra indicavi, alia quoque Parabola, quæ cum hac paria facit, & cujus descriptio ex hac adeo facile deducitur, ut novâ non sit opus. Sumatur enim*  $AD$ , *in directum*  $DA$ , & *ipsi equalis, & in directum*  $OA$ , *ipsi quoque equalis, Aω.* *Tum bisecta*  $PD$  *in*  $ξ$ , *ducatur per*  $ξ$  *recta*  $αξβ$ , *normalis ad*  $XB$ , *concurrentis cum*  $δα$ , *normali ad*  $OA$ , *in*  $α$ , & *in quam cadat normalis*  $αβ$ ; *ac fiat ut*  $αξ$  *ad*  $ξβ$ , *ita hæc*  $αλβλ$ : *Erit*  $λ$  *vertex, λξ axis, αξ latus rectum Parabole, quæ in iisdem cum priore punctis Circulum datum secabit. Sed de Problemate Alhazeni jam plus quàm satis. Vale, & quo soles affectu, tui semper observantissimum porro prosequi perge. Dab. Leodii prid. Kal. Septemb. Clod. CLXXII.*

*Epistola Doct. Johannis Wallisii, PRIMAM Inventionem & Demonstrationem Æqualitatis lineæ Curvæ Paraboloidis cum Recta, anno 1657. factam, Dn. Guilielmo Neile p. m. asserens; proximeque Dn. Christophoro Wren Equiti, Inventionem lineæ Rectæ æqualis Cycloidi ejusque partibus, anno 1658.*

Clarissimo Viro, Henrico Oldenburg; Johannes Wallis S. Octob. 4. 1673. Oxoniæ.

Clarissime Vir,

**Q**UOD ad Rectificationem istius Curvæ spectat, quam ego Paraboloidem Semi-cubicalem appellare soleo; omnino errat Cl. Hugenus (pag. 71, 72, Horologii Oscillatorii) cum ejus inventionem primam tribuit Johanni Heuratio Harlemensi, Anno 1659. Quippe certum est, eandem Biennio prius invenisse & demonstrasse Guilielmum Nelum Anglum, Equitis Pauli filium: Et, post illum, id ipsum demonstrasse (ne plures nominem) Honoratissimum D. Vice-comitem Brounckerum, & Cl. Wrennium, Anglos; circiter menses Junii, Juliique, Anni 1657. atque rem jam tum apud nostros notissimam fuisse; utpote inter eos (Geometras alioque,) qui (Soc. etatis Regiæ appellationem nondum adepti, tum solebant in Greshamensi Collegio (post habitas ibidem prælectiones Mathematicas) statis diebus convenire, publicatam & cum plausu acceptam. Idque mihi literis suis, Augusto <sup>mensis</sup> tum sequente, ad me Oxonium datis, indicavit Honoratissimus D. Vice-comes Brounker; suamque

suamque simul demonstrationem tunc misit; ipsissimam illam, quam, Latine redditam, (ne verbulo, quod sciam, mutato) meamque simul (qua paulò seriùs secuta erat,) in meâ ad Cl. Hugenum epistolâ, tractatui de Cycloide subjunctâ, post edidi Anno 1659, pag. 93. totamque simul rei gesta Historiam candidè & sincerè inserui. Ut mirum sit, Cl. Hugenum prioritatem temporis Heuratio jam tribuere, si ad illa satis attenderit qua tum scripsi; Idq; hoc solo prætectu, quòd non apud exteras gentes (nam apud nostros res percrebuit) statim exclamaverit *Ευρηκα*.

Interea temporis, Cl. Wrennium nostrum, Anno 1658, Cycloidis Curvâ (eiusque partibus) æqualem invenisse Rectam, res erat jam tum nota, non in Angliâ tantùm sed & in Galliâ Belgiôque; ipsique speciatim D. Hugenio (ut ex suis ad me literis constat) ignorato adhuc Heuratii invento; eumque omnium primum id invenisse, in confesso est. Atqui ne ipse quidem Wrennius pratendit se primum omnium invenisse Rectam Curvæ æqualem: Noverat utique, nec dissimulat, id invenisse Nelium anno præcedente. (Nec quidem ignorare poterat; nam, hac occasione, ipse, inter alios, tum statim, post Nelium, id ipsum demonstraverat.) Hanc tantùm sibi prærogativam faciens; quòd ipse Curvam Oblatam Rectificaverit; Nelius autem Curvam potius quælivit Rectificationis capacem, (de Paraboloidum quidem familiâ, sed quam nemo, quod sciam, Nelio prior speciatim consideraverat.) Wrennii verba hæc sunt, (ad calcem suæ de Cycloide demonstrationis, quam ab ipso acceptam subjunxi meo de Cycloide Tractatui, pag. 80. seu rectiùs 73. nam paginarum ibidem numerus perperam notatur;) Quod de nullâ Curvâ hætenus notâ (ne quidem assumptâ Circuli quadraturâ) priùs demonstratum fuit quàm ego hæc de Cycloide primariâ amicis communicaveram; nisi quòd Illustris Juvenis *Gulielmus Nelius*, curvam quândam ita construendam, ut sit Euthymii capax, summâ cum laude invenerat. Quæ cerè Wrennius non dicturus esset, si Euthymus ille Nelii non fuisset suo prior; quo tamen posteriorem esse Heuratianum in confesso est.

Eandem autem Nelii curvam esse atque Heuratii, non ambigitur. Eam verò Parabolœidem esse, non magis dixit Heuratiùs in demonstratione sua, quàm in suâ; Nelius sed neque ex earum numero esse quarum puncta quælibet Geometricè definiuntur, quod in Neliana desiderat Hugenius; (ut neque hîc Heuratii partes sint quàm Nelii potiores:) quanquam ex utriusvis demonstratione id facile elicitur, (ut nec hic nec ille propterea censendus sit id ignorasse,) ut & ex illa Honoratissimi Brounckeri: (ut de mea nihil dicam; qua nominatim dicitur, & demonstratur esse, Paraboloides Semicubicalis:) Et quidem res erat tam manifesta, ut nemo nostrum (quod sciam) de illo quicquam dubitaverit.

Et quidem demonstratio Nelii, prout eam ille primò publicavit, prolixior fuit & fusiùs explicata; sed Wrennii consilio, in breviorē formam statim contracta, (quam, mihi petenti missam, edidi,) rescissis omnibus qua non erant ad Euthymii demonstrationem præcisè necessaria; (ut non mirum sit, ibidem non omnia comparere, quæ alias de natura curvæ dici potuissent, utpote ad præsens negotium non spectantia.) Quod postquam à Wrennio resciveram, cupiebam quidem, ut & fusiorem illam formulam conspicerem; sed, cum, ut à

Nelio mihi mitteretur, literis petebam, pro responso nuncium accepi, obiisse Nelium: unde factum est, ut illam non viderim.

Sed perinde est; nam & eodem sensu, (vim demonstrationis quod spectat,) & eodem quasi tempore comparuit utraque; nescio an paucorum dierum intervallo; certè non tanto, ut alicujus sit momenti, Heuratium quod spectat. Et quidem, contractior illa formula, omnia habet ad demonstrationem necessaria; ipso quidem Hugenio proficiente (literis suis ad me datis 15 Julii 1660) his verbis: Fermatii libellum novum simul ad me misit Carcavius, de Curvarum linearum cum rectis comparatione; in quo præcipue agitur de Paraboloidæ illa, quam jam ante apud nos Heuravius, apud vos Gu. Nelius rectæ lineæ adæquavit. Post quod non speraveram, ab Hugenio dictum iri (quod jam video) non multum quidem ab invento illo Nelium abfuisse, neque tamen id planè assecutum esse. Atque ego Geometrarum omnium (qui vel D. Brounkeri, vel Nelii demonstrationem à me editam conspexerint) fidem testor, Annon fuerit rem demonstratu susceptam plane assecutus. Sed & Honoratissimum D. Brounkerum testor, annon sua fuerit, atque ejusdem temporis, quam suo nomine Demonstrationem ediderem: Et Cl. Wrennium, (qui & ipse Nelio superstes est,) annon prolixior Nelii demonstratio, fuerit (ejus consilio) in eam formam redacta, atque tum temporis, quam ego edidi.

Audiebam porro, sub idem tempus, idem ab aliis Londini fuisse demonstratum: Sed postquam demonstrationem unam atque alteram vidiſsem, fueritque (nemine reclamante) pro demonstrato habitum, non eram sollicitus plures conquirendi. Atque cum Cl. Schotenius librum ab ipso tum nuper editum (cui Heuravianum hoc inventum subjunxit) mihi (pro humanitate sua) dono misisset, meminì, me proximis ad eum literis significasse, Inventum hoc Heuratii id ipsum esse, quod ante duos annos invenerat Nelius; quodque ex eo tempore apud nostros pervulgatum fuit, & à variis demonstratum: quod ipsæ (si extant) testabuntur literæ Novemb. 26. 1659, datæ. Idemque in suis, eodem ipso die ad me scriptis, habet Honoratissimus D. Brounkerus, his verbis, And indeed Heuraets invention is perfectly equipollent to Mr. Neil's, and for ought I know, he might have it from thence. Et quidem abundè testium tum esse posset (dum temporum momenta erant in recenti memoria,) si ulla foret suspicio, post tot tandem annos, litem de hoc negotio motum iri.

Et quidem quod ad reliquas ipsius Curvæ proprietates spectat, ejusque genuinam naturam, (quas Heuravius non magis quam Nelius tradidit, sed disertis verbis declinat;) saltem Fermatius (ut ut Vir magnus) non modò non tradidisse sed neque tum perspexisse censendus erit. Quippe ille (quod certe non foret factururus, si satis intellexisset curvæ illius naturam,) varia se invenisse Curvarum genera gloriatur; quæ non sunt nisi eadem ipsissima Paraboloeides, sumptis tantum pro vertice punctis ejusdem curvæ aliis atque aliis. Quod in meis ad D. Kenelmum Digby literis Parisios datis 24 Aug. 1660 (biduo postquam libellum illum, à D. Digbæo ad me missum, primum inspexeram,) demonstravi: Idemque in meis ad D. Hugenum, ejusdem mensis die 31 datis, indicavi. Sed metuo ne nimis videar in re perspicuâ.

Nolim

*Nolim autem ut hac malo animo dicta putes, sive in Heuratium (qui mihi neque beneficio neque injuria notus est,) sive in Cl. Hugenum, quem magni semper habui, atque habiturus sum, & amicissimè semper tractavi; ejusq; atq; inventorum suorum non iniquus fuerim estimator; nedum in Fermatium, summum virum: sed ut nuda veritati testimonium perhiberem, Nelioque jam demortuo; iisque ex nostris omnibus, qui, jamdiu ante Heuratium, id ipsam demonstraverant; atque, ne mala fidei habeat, in ea quam hac de re narrationem priùs edidi. Vale.*

*Two other Letters to the same purpose with the former: The first of the Right Honourable the Lord Vis-count Brouncker, Chancellor to her Majesty, and President of the R. Society, &c.*

*S I R,*

**I**T is very sure, that Mr. William Neil had in the year 1657. found out and demonstrated a Streight line equal to a Paraboloeid; and did then communicate and publish the same (though not in print) to my self and others, who used to meet at *Gresham* Colledge, and it was there received with good approbation; and the same was, presently afterwards, otherwise demonstrated by my self and others: And therefore ancienter than that of Monsieur *Heurat*, which (as it seems,) is not pretended to have been done before the year 1659; and ancienter too than that of *Sr. Ch. Wren*, finding a Streight line equal to a Cycloid in the year 1658; and by him admitted so to be. Nor ought it at all to prejudice Mr. *Neil*, that M. *Heuraet's* was somewhat sooner abroad in print, than that of M. *Neil*, (though both in the same year 1659;) since it is well known to many of us, that Mr. *Neil's* was done before. Otherwise M. *Hugens*, by the same reason, will grant the precedency to *Heuraet*, of that which he now claims to be his own invention (that Rectifying the Parabolical Line and Squaring the Hyperbolical Space do mutually depend on each other :) for this was published in print by M. *Heuraet* (or M. *Schooten* for him) in the year 1659, and not by M. *Hugens* till now, 1673: And yet M. *Hugens* thinks, he may well claim that invention to be his own, because he now tells us, that he found it out about the end of the year 1657, and did (some time after) communicate it privately to some friends. And whereas, he doth suppose, that this invention of his might give occasion to that other of *Heuraet*; we may also as well suppose, that he might have taken such occasion from hearing of Mr. *Neil* having done the like, (for this had been then commonly known for a great while: ) Or might have taken occasion (as well as Mr. *Neil*) from that of Dr. *Wallis Schol. prop. 38. Arith. Infin.* or from that of *Sr. Ch. Wren* having found a Streight equal to another Curve the year before: Or, if it were necessary to know their symbolization between the Parabolical Line and the Hyperbolical Space; he might have had it earlier from Dr. *Wallis*. For, when he had demonstrated (*Schol. prop. 38. Ar. Infin.*) that the Particles which compose the